Postings: from the desk of Jim Brodrick

Last week, DOE announced more than $37 million in American Recovery and Reinvestment Act (ARRA) funding for 17 solid-state lighting (SSL) R&D projects. Three of those projects focus on core technology research - that is, on advancing the technical knowledge base of SSL for general lighting purposes - and six focus on product development. The remaining eight projects, which received nearly $24 million of the ARRA SSL funding, focus on manufacturing.

While this is the sixth round of DOE funding for SSL core technology research and product development, it marks the first time we've funded SSL manufacturing projects and reflects DOE's new commitment to accelerate the adoption of SSL technology through manufacturing improvements that reduce costs and improve quality.

I don't focus very often in these Postings on our SSL R&D activities, but they're extremely important, because they lead to advances in efficacy and performance that might not otherwise be achieved without DOE funding. This latest funding round represents an additional flight of stairs leading us higher up the SSL knowledge tower. Together with the four core technology research projects announced last summer, it makes for a total of 21 new DOE-funded SSL R&D projects.

All told, there are now 70 DOE-funded SSL R&D projects underway, in various stages of completion. These projects are working quite literally on the frontiers of science, and are instrumental in pushing the envelope of SSL technology. The rapid progress in the field of solid-state lighting has made it possible in the past year for some LED lighting products to actually compete with their conventional counterparts in the real-world marketplace, for certain applications. An impressive achievement, but we still have a long ways to go. While driving products from lab to market is a major goal of DOE's solid-state lighting program, we're pushing equally hard in the laboratory, trying to further improve the underlying technology and

explore new and different pathways to increase performance and reduce cost.

So although we're seeing many more LED lighting products on the market today than we saw before, and their quality is steadily improving, there's still a lot of work to be done. SSL hasn't come close to achieving its potential, despite the rapid pace at which it's been developing. We've repeatedly raised the bar as our knowledge has increased, and we don't know for sure what the limits are, so we're not certain how high it can go. Just a few years ago, who would have thought that the cell phone - itself a futuristic concept in previous decades - would evolve into the hand-held computer it's become today?

When DOE started its solid-state lighting program, 100 lm/W sounded like an ambitious goal to reach. Today, we're seeing SSL devices in the laboratory that produce 130 lm/W, even 180 lm/W, and we're thinking that 200 lm/W may not be out of the question. That's what this R&D effort is all about: finding new ways to climb whatever "wall" impedes our progress - whether by using different substrates, different ways of packaging the LEDs, or some other method to improve performance.

As might be expected, the 70 active DOE-funded SSL R&D projects cover a wide range of topics. Why are we pursuing so many different threads? Simply because we don't know which ones will end up making a significant difference. That's the way science invariably works - you explore different routes until you find the one, or ones, that lead to your destination. It may sound like "trial-and-error," but it's not exactly a matter of shooting in the dark. The areas of investigation are chosen with great care, as are the partners and projects - which DOE selects based on such factors as energy savings potential, likelihood of success, and alignment with the DOE SSL R&D Multiyear Plan and SSL Manufacturing R&D Roadmap.

The diligence has paid off for both sides. Since 2003, DOE has worked with more than 200 research partners to accelerate SSL advances as well as to drive the technology from lab to market, resulting in over 100 patent applications. The significant

achievements of some of those partners will be recognized at our annual SSL R&D Workshop next month in Raleigh, North Carolina. Congratulations to those partners, as well as to the new funding selections. We look forward to more flights of stairs as we wind our way upwards.

As always, if you have questions or comments, you can reach me at postings@lightingfacts.com.